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Dietary fibre-definition, chemistry and analytical determination

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Abstract

Dietary fibre includes non-starch polysaccharides and lignin that are not digested or absorbed in the human small intestine. It contains a mixture of chemically complex polysaccharides. Lignin is a highly cross-linked complex polymer of phenylpropane units. The plant cell wall is the main source of dietary fibre and its structure is reviewed briefly. The structure of the main dietary fibre polysaccharides is then summarized.

The demarcation between starch — the main digestible polysaccharide — and dietary fibre presents some problems due to more or less enzyme resistant starch fractions that occur naturally or are formed with processing. “Resistant starch” formed during baking passes through the small intestine in the rat and, probably, in man and is fermented in the colon. It should therefore also be regarded as dietary fibre.

Methods for dietary fibre determination fall into two categories: (1) gravimetric methods, weighing the dietary fibre after removal of other components; (2) component analysis methods, determining monomeric composition of fibre polysaccharides (preferably by gas-liquid chromatography) supplemented with a gravimetric lignin determination and separate assay of uronic acid components (pectin). Recently developed enzymatic gravimetric methods are most convenient for the assay of total dietary fibre or water soluble and insoluble fibre separately, whereas component analysis is required for determining the dietary fibre composition.

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